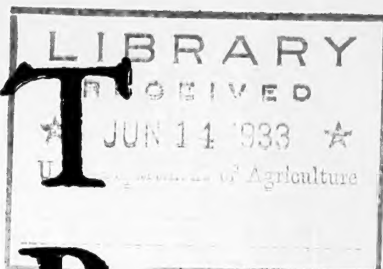


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FOREST WORKER



May 1933

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Announcements

Winners of Pack Fellowships

Three Americans and two Canadians were selected by the Charles Lathrop Pack Forest Education Board to receive the fourth annual awards of fellowships. The successful candidates and their projects are:

Walter U. Garstka, instructor in forestry, Pennsylvania State Forest School. To make organic analysis of leaf litter collected from forests growing on podsolized and brown-earth soils immediately after its fall in the autumn.

Harold R. Hay, graduate student, University of Wisconsin. To make a study of changes in the physical properties and chemical constituency of wood subjected to steam treatments.

John Edward Liersch, junior forester, British Columbia Forest Service. To continue a demonstration begun under a 1932 Pack fellowship regarding the

practicability of economic selection in the Douglas fir region.

Nicholas T. Mirov, graduate student, University of California. To make a study of transpiration by different forest cover species with reference to precipitation and moisture content of the soil.

Louis Rene Scheult, graduate student, University of Toronto, Toronto, Canada (also holder of a 1932 Pack award). To make a regional study of forest development in relation to the pulp and paper industry in a typical forest region.



The annual meeting of the National Conference on State Parks will be held May 25-27 at Bear Mountain Inn in the Palisades Interstate Park on the Hudson River, N.Y.

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State Forestry

Wisconsin Profits from Relief Program

Reduction in forest fire damage in Wisconsin during 1932 resulted at least in part from the work done by unemployed labor in reducing fire hazards in the forests, says Paul D. Kelleter, Director of Conservation of Wisconsin. Mr. Kelleter considers that the decrease in damage caused by forest fires from \$421,501 in 1931 to \$69,320 in 1932 in Wisconsin forest protection districts is an example of what is meant by "self-liquidating" forest relief work.

Of the \$500,000 appropriated by the State in 1932 to relieve the distress of the unemployed and to develop and augment the facilities for forest protection, \$464,221.08 was expended by the conservation department, \$369,691.98, or 85.45 percent, being paid in wages to 12,790 men in 35 counties. Most of the men employed were from cities and towns near the districts in which they worked. Common labor was paid at the rate of 25 cents per hour for the first 4 weeks and 30 cents per hour thereafter. Foremen, graders, and tractor operators were paid 35 to 40 cents per hour. Teams and trucks were hired at local prevailing rates.

Work accomplished included the building of new fire roads and firebreaks; fire hazard elimination; construction and improvements; and miscellaneous projects, with funds distributed among the projects as follows:

One thousand and twenty miles of new fire road were constructed at a total cost of \$374,299.17, or 80.62 percent of the total expenditure. In constructing these roads, which cost \$366.96 per mile, 17,497 rods of fill, 266 bridges of an average length of 22.7 feet, 764 culverts, and 299 gates were installed.

Three hundred and forty-two and two tenths miles of firebreaks were constructed at a total cost of \$40,655.40, an average cost per mile of \$118.81.

Fire hazard elimination included cutting of snags, burning of road slash, brushing of telephone line, and disposal of slash, at a total cost of \$10,669.82.

Eighteen thousand six hundred and seventy-nine dollars and ninety-seven cents was expended on construction, including the building of 21 new fire towers, 12 tower replacements, and 8 tower relocations; tower repairs; addition, improvements, and repairs to ranger sta-

tion buildings; construction of 190.9 miles of new telephone line at an average cost of \$35.86 per mile; and improvements to old telephone lines. Practically the entire expenditure from the relief funds for these projects was for labor, supplies and materials being charged to other funds wherever possible.

"Miscellaneous" included construction of gates not in other projects; brushing; cruising; tower cabin construction; administration and supervision; and tools, supplies, and transportation not charged to other projects. The expenditure under this classification was \$19,916.72.

Director Kelleter states that projects planned by the conservation department for 1933 would provide work for 16,000 to 40,000 men, depending upon the funds made available by the State.

Tennessee Plants a Million Trees in Spring Season

By JAMES O. HAZARD, State Forester, Tennessee

One million forest tree seedlings were planted in Tennessee during the spring planting season of 1933, January 15 to the last of March. Among the species planted, black locust, yellow poplar, shortleaf pine, and loblolly pine predominated.

Approximately 800,000 of the seedlings were black locust. This species is favored by Tennessee planters because of its rapid growth on the waste areas which have developed on so many farms in the State. These areas planted to locust very soon supply the farms with fence posts and often provide additional posts for sale. It is not unusual in west Tennessee to find \$100 worth of posts per acre in a 10-year-old plantation on land so badly eroded that it was absolutely useless for agricultural purposes.

Shortleaf pine is being planted on eroded, "raw" soil because of its superior capacity to grow on this type of land. Loblolly pine is planted on soils which are ordinarily considered suitable for locust where the farmer prefers a crop of pine. Considerable interest has been manifested in pine in west Tennessee during recent planting seasons. There has also been a demand in recent years for yellow poplar seedlings. Many farmers who remember the large yellow poplars of

earlier days in this region are anxious to bring back, or start to bring back, the poplar timber.

Approximately 500,000 acres of badly eroded farm lands in west Tennessee are in need of planting. The area of 1,000 acres planted this year is small in comparison, but still constitutes a substantial beginning.

Blister Rust Control Work Helps the Unemployed in Maine

In spite of unfavorable economic conditions, including the slump in white pine values, blister rust control work in Maine increased during 1932, according to W. O. Frost, blister rust agent. Work was conducted in 56 towns and cities in 13 counties, and 34 of the towns appropriated cooperative funds. The eradication season began May 9 and ended September 10, with 8 experienced temporary men employed for advance scouting and the supervision of eradication crews. Each blister rust agent supervised 2 to 6 eradication crews during the season, a crew consisting of 4 to 6 men.

Blister rust control helped solve the unemployment problem in 9 cities and towns, 66 men being employed approximately 14,000 hours at a cost of \$4,045.24. The scale of wages averaged about 30 cents an hour, some towns making cash payments while others paid only a portion in cash and the remainder in credits for groceries, fuel, etc. The towns financed the work and upon its completion were reimbursed by the State in the amount of 50 percent of the total expenditures. The men, after a few days' training by the agents and under the supervision of trained foremen, did satisfactory work.

The total cost of the control work, which covered 79,701 acres, was \$16,626.56, expended by all cooperating parties (the Federal Government, the State, towns, and private owners). The cost per acre was 21 cents. Ribes plants eradicated totaled 905,810 wild and 4,726 cultivated, an average of 11 plants per acre.



President Roosevelt has ordered from the New York State Conservation Department 5,000 tulip-poplar seedlings and 1,000 balsam transplants for planting on his estate at Hyde Park, Dutchess County, N.Y. This year is the first time the department has been able to produce satisfactory tulip-poplar seedlings and the President was given the first opportunity to purchase some of them.



During the past 10 years 10,000 redwoods have been planted on the island of Hawaii in the Territory of Hawaii. The territorial forestry department reports that the average survival of these trees is 97.9 percent.

The Yield Tax and the 1933 Legislatures

By LOUIS S. MURPHY, United States Forest Service

Bills embodying recommendations of the National Lumber Manufacturers Association that the application of the yield tax be broadened to include mature timber being held for exploitation were introduced in the legislatures of Idaho, Oregon, and Washington in the 1933 sessions. None was enacted.

In Oregon, opposition, it is reported, came chiefly from holders of small bodies of timber which would be entirely cut out during the 10-year transition period provided in the bill for a gradual change from the property tax to the yield tax. On such holders the tax burden promised to be definitely increased instead of decreased.

In Washington, the proposal, in the form of a deferred property tax, struck a constitutional snag, necessitating an amendment to the constitution as a preliminary. If such an amendment is adopted at the next session of the legislature, 2 years hence, the way will be cleared for the enactment of the proposed law.

In Idaho, the bill first introduced was withdrawn for revision, and the revised bill failed to be acted upon when subsequently introduced.

While this was going on in the Northwest, Maine, in the Northeast, repealed a yield tax law because of its adverse effect on local revenues. The law was originally enacted in 1921 and completely revised and strengthened in 1929. Forest owners made little use of it, however, until recently, perhaps regarding it, in the words of its author, as an "umbrella law—something to get under when property taxes came down too hard." However, when they tried to use it in that manner, as many have done since the depression set in, the umbrella blew inside out, so to speak. The towns, whose revenues were thereby seriously affected, insisted on its repeal.

At this writing some of the State legislatures are still in session, at least one of which, that of Florida, will probably have an opportunity to vote on the yield tax.



An additional 95,000 acres in 10 Oregon counties has recently been classified for reforestation by the State Board of Forestry, increasing the total area so classified to 725,000 acres.



Alabama's 13 State forests range in size from 5 to 5,480 acres. Only 2, however, exceed 40 acres in extent. The total acreage is 8,910.

Experiments with Scotch Pine Transplants in New York

An experiment conducted by the Division of Lands and Forests of New York State shows that root pruning of 4-year Scotch pine transplants does not pay. In an effort to determine whether it is better to double up the roots of this large-sized stock in the planting hole or to prune them back moderately, the roots of parts of several lots of transplants of this size were lightly pruned before planting in the experimental tract on Montgomery County Reforestation Area No. 1. The pruned and unpruned pines were planted in alternate blocks of about 100 trees each. The average survival percentages were: Pruned, 52; unpruned, 67.

That 3-year transplants of Scotch pine are as large stock as can be handled to advantage was shown by another experimental planting of 3- and 4-year-old pines on the Poke-O-Moonshine area. The two lots were lifted at the Saratoga nursery on the same day, shipped together, and planted on adjoining areas by the same crew. One lot was of large 4-year transplants, the other of 3-year seedlings. The planting was done late in the season (May 13-14) and was followed by dry weather; under more favorable conditions the difference in survival percentages might not have been so great. Of the 3-year stock, 776 out of 898, or 86.4 percent survived; only 33.7 percent of the 4-year transplants, or 288 out of 853, survived.



A study of areas of Mississippi woodland from which fire has been excluded for 5 to 50 years has been undertaken by the Mississippi Forest Service, advises State Forester Fred Merrill. Although such areas are rare in the State, several small unburned tracts have been found, and landowners and others are urged to report any additional areas of which they have knowledge. The studies will be made to ascertain the results that may be expected from fire prevention.



According to figures recently compiled by the New York State Conservation Department, at the end of 1932 there were growing in the 6 State-owned nurseries no less than 146,465,000 trees. Of these, 750,000 were 4-year transplants, 23,805,000 were 3-year transplants, 42,546,000 were 2-year seedlings, and 79,364,000 were 1-year seedlings. Last year the State used 22,000,000 trees on reforestation areas and distributed in all a little more than 40,000,000 trees. About half of the trees planted on reforestation areas were 3-year transplants and the other half 2-year seedlings. As the nursery stock increases it is planned to set out a larger number of 3-year transplants, since the longer period of growth in the nursery means a higher percentage of survival.

Southern Pine Beetle Found in Pennsylvania

Infestations of the southern pine beetle (*Dendroctonus frontalis*) have been found in two State forest districts in Pennsylvania. Although there are records of this insect having been present in the southern part of the State, severe attacks have heretofore been practically unknown.

At Mont Alto the beetles were found working on a stand of pitch and shortleaf pines which had made rather slow growth for 3 years. In the Buchanan State forest district the insects appear to have followed a 1930 fire. On Martins Hill, Bedford County, the beetles had attacked pitch and Virginia scrub pines; trees containing larvae were observed at the foot of the mountain and up to an elevation of 2,900 feet.

Minnesota Still Has Some Virgin Pine

A 180-acre stand of 200-year-old virgin white and Norway pine in the Pine Island State Forest, Minn., and on adjoining private lands, was recently examined by L. B. Ritter, blister rust agent. The stand was estimated to contain 6,000,000 board feet of timber with less than 5 percent of cull. Diameters of the white pine measured up to 40 inches with an average height of 110 feet. Excellent white pine reproduction has come in abundantly during the past 20 years.



Fires burned 80 percent of the forest land in some south Georgia counties in 1932, reports the Georgia Division of Forestry. The extreme drought of the 1932 season aggravated the fire hazard and was responsible for the unusual losses. The damage caused by the 23,560 fires that burned over 6,691,186 acres is estimated at \$7,302,960. Fires on forests belonging to timber protective organizations were held to 12 percent of the total area while on unorganized lands the area burned was 30 percent of the whole.



Salt Lake City, Utah, has ordered more than 10,000 trees for planting on the watershed furnishing the city's water supply. The species being planted include piñon pine, Rocky Mountain juniper, Douglas blue spruce, ponderosa pine, and lodgepole pine.



H. B. Peirson, State entomologist of Maine, reports that a large area of balsam fir has been killed in that State by an aphid (*Dreyfusia picea* Ratz.) and that the insect is increasing at an alarming rate.

Forestry Activities in the Hawaiian Islands

Ridding Hawaiian forests of destructive wild animals is one of the principal activities of the territorial board of agriculture and forestry, according to C. S. Judd, territorial forester. Assisted by the National Park Service and private ranchers, forest officers succeeded in eliminating 17,637 goats, pigs, sheep, cattle, asses, deer, and horses in 1932.

In building a pig hunters' cabin at the summit of the Koolau Range on the island of Oahu, the board was assisted by the United States Army Air Corps in delivering the material to the site. Three bundles containing redwood timbers, tin wall material, and corrugated iron roofing, weighing 400 pounds each, were dropped from a height of 30 feet by Army airplane bombers within 200 feet of the spot designated. The contents of only one bundle were damaged by the drop. The cabin, 10 by 10 feet in size, was completed in December 1932.

A garden of Hawaiian trees and shrubs was started in 1932 at Waahila near Honolulu by the board of agriculture and forestry in cooperation with the University of Hawaii. Eleven species of native trees and shrubs have already been planted.

Nearly one fourth of the land area of the five main islands of the Hawaiian group, or 1,027,299 acres, is now included in the 64 territorial forest reserves devoted to forest protection. Four nurseries distributed 907,280 trees and plants in 1932, 55 percent of which were planted by farmers, 5 percent by other individuals, and 40 percent by the board in the forest reserves.

Virginia reports a bad fire year in 1932, with a total of 1,735 fires, but the record of area burned in organized territory has been bettered in only two other years. In 1932, 0.88 percent of the total protected area burned; the two records that surpassed this were made in 1929, with 0.55 percent, and in 1927, with 0.34 percent. The average area burned per fire in 1932 was 49.7 acres, the lowest recorded.

The cork oak of southern Europe and northern Africa, whose bark supplies the cork of commerce, will thrive in various parts of Alabama, announces the Alabama State Commission of Forestry. Investigations made by the commission indicate the possibility that the production of cork may prove to be a source of revenue to Alabama landowners.

By proclamation of Gov. Herbert H. Lehman, the week of April 8 was conservation week in New York State.

White Pine Plantation in Vermont Shows Good Growth

While inspecting a white pine plantation at Chester, Vt., F. H. Rose, blister rust agent, made a study to determine how fast the trees were growing. The plantation was established 20 years ago with the trees spaced 6 by 6 feet. Data were taken on a $\frac{1}{8}$ -acre plot containing 116 living and 25 dead trees.

The tallest tree was 44 feet high, the average height being 30 feet; the greatest diameter was 9 inches, and the average 5 inches. There were 90 dominant trees, 25 intermediate trees, and 1 living suppressed tree. The average height growth per year was 17 inches, the greatest growth in height in any year being 42 inches.

Ninety-four of the trees were straight and well formed; 76 of these were dominant and suitable for final crop trees. The remaining 22 had been injured, some by weevil, and were poorly formed. Six were infected with blister rust.

The Virginia Forest Service last year conducted 63 forest fire law violation cases, 45 of which resulted in convictions. Fines and court costs aggregating \$654.10 were imposed, and two men were given jail sentences of 6 months each. Forest-fire suppression costs in the amount of \$1,551.37 were collected during the year from persons responsible for fires.

A new steel lookout tower 45 feet high was constructed last year by the New Hampshire State Forestry Department on one of the Milan Hills. This tower will give increased protection to the woodlands of the Androscoggin and Upper Ammonoosuc Valleys. The site was made available through the cooperation of the Brown Co.

New Jersey will use more than 666,000 seedlings this spring for planting in fire-damaged and poorly stocked stands in the State forests of the coastal plain region of south Jersey. The principal species to be planted are loblolly, shortleaf, and pitch pines. Orders for more than 2,500,000 seedlings from the State nurseries to be planted throughout the State have been received this spring, according to the division of forests and parks.

A recent Utah law designates blue spruce the official tree of that State. The measure was sponsored by the Utah State Federation of Women's Clubs.

Education and Extension

Cold Damages Windbreak Trees in Central and Northern California

By WOODBRIDGE METCALF, Extension Forester, California

For a number of years California ranchers have depended on exotic trees to protect their crops, animals, and buildings against heavy winds and the summer sun. Species of the genus *Eucalyptus* have been the most popular and widely used, but other trees from semitropical countries have also been grown for shade and for ornamentation of home grounds. As periods of cold weather have been of rather infrequent occurrence in this region during the past 30 years, these exotics came to occupy a more and more important place in the vegetation of the Sacramento and San Joaquin Valleys. Several of them made rapid and vigorous growth, reached large size, and were everywhere in evidence in the valley landscape.

During the second week of December 1932, there occurred what the Weather Bureau describes as a "blow-in" freeze which came with a northeast wind of 25 to 30 miles an hour velocity, lasted for 15 to 36 hours, and brought the lowest temperatures since 1884 to these valleys. The thermometer dropped to 11° F. at Chico, to between 12° and 15° at other points in Glenn, Yuba, Yolo, and Sacramento Counties, and to 15° and 18° in other widely separated places as far south as Fresno and to points along the coast somewhat south of San Francisco Bay. Besides the unusually low temperatures, the very low humidity that accompanied them was extremely damaging to vegetation. Mr. Leslie Gray, of the United States Weather Bureau, informs me that there are records of the occurrence of four periods of somewhat similar nature, though those in the nineties and between 1905 and 1907 did not bring quite as low temperatures as those in 1884 and 1932. An additional reason for the heavy damage this year was the unseasonably warm weather of the fall, which persisted until about a week before the freeze.

From 10 to 15 varieties of *Eucalyptus* have been used in this region, and all of them were more or less badly damaged by the freeze. It seems that the physiological condition of individual trees has much to do with their ability to withstand the cold, for here and there, in windbreaks and groves in which most of the trees were killed to the ground, trees are to be seen which have retained a fair proportion of their crowns in good condition. Most of the semitropical exotics lost all of their leaves, and many of them were killed at least to the ground. In the places where minimum temperatures of 11° to 15° were experienced, it is doubtful if any trees will recover by sprouting from the ground line, as the bark has split and separated from the wood in

many cases. On April 1, 1933, some of the trees showed a few green shoots along the lower trunk, but it was too early to tell how many of them would put forth sprouts.

The species which show severest damage to foliage and were probably killed down to the ground are: Blue gum (*Eucalyptus globulus*); red gum (*E. rostrata*); desert gum (*E. rudis*); yellow jacket (*E. punctata*); Australian silk-oak (*Grevillea robusta*); pepper tree (*Schinus molle*); bottle tree (*Sterculia diversifolia*); Canary Island pine (*Pinus canariensis*); Australian beefwood (*Casuarina equisetifolia*); desert athel (*Tamarix articulata*); Canary Island palm (*Phoenix canariensis*); acacias (*Acacia melanoxylon* and *A. baileyana*); gray gum (*Eucalyptus tereticornis*); swamp mahogany (*E. robusta*); and Australian beech (*E. polyanthemus*).

The varieties of *Eucalyptus* listed above are generally considered to be rather hardy. Of the less hardy varieties, many more were killed. The manna gum (*E. viminalis*), although severely defoliated in some localities, seems to have resisted the cold weather better than any other eucalypt. Even these are probably killed to the ground along with all of the other *Eucalyptus* species in the 25-year-old plantations at the Chico Forestry Station. Another tree which in many places has been able to persist with a fair proportion of its crown intact is the *Acacia decurrens dealbata*. In some places, well-established trees of *Tamarix articulata* persisted, though they show severe damage.

Even native vegetation was not entirely unscathed, as coast live oak, toyon, and madrone showed considerable browning of the leaves. Many of the groves and windbreaks are now being cut for fuel, and it is certain that as a result of the December freeze wide areas of the valley country will present an appearance quite different from that of the last 20 years.



The number of students taking the complete forestry course at the University of California has doubled in the last 3 years. In the spring of 1930 there were 80 students; this term there are 160. In addition, the school gives forestry instruction to a considerable number of students from other departments of the university. Because of the junior college system in California whereby students can take the first two years at an institution near home, the junior and senior classes at Berkeley are larger than the freshman and sophomore groups. There are 36 in this year's senior class. Graduate students number 37 and come from all sections of the United States, with a few from foreign countries.

Ashe Herbarium Acquired by North Carolina University

Through the generosity of George Watts Hill, of Durham, N.C., the herbarium of William W. Ashe, forester and systematic botanist who died in March 1932, has been acquired by the University of North Carolina, of which Mr. Ashe was a graduate. Most of the collection is unmounted, but Mr. Hill's gift makes possible the assembling and mounting of the specimens by T. G. Harbison, an experienced collector and a coworker of Mr. Ashe. It is expected that the herbarium will be ready for use this summer.

The university has also received, from Mrs. W. W. Ashe, a large number of reprints of Mr. Ashe's papers on botanical and forestry subjects. In his scientific writings Mr. Ashe published 510 new botanical names (including species, varieties, and forms).

Mr. Ashe was connected with Government forest work from 1899, and at the time of his death was inspector in the eastern Forest Service region.

Planted Snow Fences in Minnesota

Finding the use of portable snow fences along its rights of way in Minnesota expensive, the Great Northern Railway Co. began several years ago to plant trees to act as permanent snow catches. Now conifers, willows, and caragana are grown for this purpose in nursery gardens managed by the section foremen of the company, who also plant and care for the trees. Parker Anderson, extension forester of Minnesota, cooperated with the railway in working out plans for the production of stock and the planting and maintenance of the trees. In addition to the excellent results obtained from these permanent fences in the way of protection from drifts, the rows of trees add to the attractiveness of the Great Northern's route through the State.



A number of traveling fellowships for study in Scandinavian countries, carrying \$1,000 each, are being offered by the American-Scandinavian Foundation to students of American birth. Graduate students, instructors, and younger professors are eligible. Further information may be obtained from Neilson Abeel, secretary of the foundation, 25 West Forty-fifth Street, New York City.



Prizes of \$50, \$30, and \$20 were awarded to winners in the annual Charles Lathrop Pack essay and declamation contest held March 1 at the New York State College of Forestry, Syracuse, N.Y. Harry Dengler, class of 1934, won the first prize with an essay on *The Necessity for Public Interest in Forests*. This *Business of Forestry*, by Esmond W. Sears, '33, won the second prize, and third honors went to William S.

Beckley, '36, whose subject was *Forestry and Unemployment*.

New York 4-H Clubs Keep up Planting Record

No lessening of the activities of the 4-H club tree planters of New York has taken place this year, reports J. E. Davis, assistant extension forester of the New York State College of Agriculture, who assembled 4-H tree orders for this spring's planting season. Mr. Davis states that orders have been received from 1,355 farm boys and girls, the enrollment in 4-H forestry clubs falling only 24 behind last year's record.

Four counties have over one hundred 4-H tree planters enrolled for 1933. Allegany leads with 187; Wyoming has 134; Oneida 113; and Chautauqua 104. Erie County is a close fifth with 94 forestry club members.

The State Conservation Department gives 1,000 trees free to each new 4-H forestry club member, so 4-H foresters will plant 1,355,000 trees in 1933. This year's tree planting season will mark the eighth year of 4-H forestry club work in New York State, and the planting by club members of more than 6,500,000 trees on New York's idle acres since the project was started in 1926.

Through the medium of the 4-H clubs the practice of reforestation and a better knowledge of farm forestry have reached over 6,000 New York farms. Trees for 4-H plantations are generally selected with one or more of three purposes in view: Production of timber for home use; fence posts for home use and for sale; and Christmas trees for sale. For these purposes Norway pine, European larch, black locust, and Norway spruce have been in greatest demand.

Tree Distribution in Puerto Rico

During the calendar year 1932 the number of trees distributed from the three nurseries of the Puerto Rico insular forest service was 1,826,072, according to a report of Charles Z. Bates, extension forester of Puerto Rico. These trees were planted by private individuals, agricultural agents, Government departments, corporations, public institutions, and 4-H clubs; 14,769 of them were planted on the insular forests, 3,079 on the Luquillo National Forest, and 13,050 were shipped out of the island. Stock distributed to farmers under the terms of section 4 of the Clarke-McNary law represents 86 percent of the total number.

Species grown in the insular nurseries include Casuarina, Spanish cedar, raintree, mahogany, eucalyptus, and other native trees. In spite of the hurricane of September 1932 which created widespread devastation in the island, the general depression, and the low price of sugar, Mr. Bates reports that the demand for trees for farm planting this year greatly exceeds the capacity of the nurseries.

Cornell Foresters Spend Spring Vacation in Southern Camp

For the sixth consecutive year, a group of Cornell forestry students (seniors and graduates) spent the spring recess, which this year occurred between March 29 and April 12, at Witherbee, S.C., headquarters of the North State Lumber Co. Their camp was located 40 miles up the Cooper River from Charleston, where they occupied a building erected by the company for the use of foresters. Camp equipment was furnished by the U.S. Army post at Fort Moultrie, S.C. Twenty students registered for the trip and were accompanied by Prof. A. B. Recknagel, who also led the previous expeditions.

The holdings of the Cooper River Co., a timber creosoting plant in Charleston, and the experimental plantings of the Clemson Agricultural Station at Summerville were visited by the students. In 1928 the Cornell group established permanent sample plots to serve as a check on the measurement of growth and reproduction of southern pine forests. These plots were remeasured and records made of the 5 years' growth.

Benefits of Windbreaks Demonstrated in Minnesota

On the open Minnesota prairie the cold January wind was blowing at a rate of 27 miles an hour, according to the extension forester's anemometer. In the shelter of a windbreak on a near-by farm a few minutes later the same gauge registered only $3\frac{1}{2}$ miles an hour. This practical demonstration of the protective possibilities of a well-placed and properly planted windbreak was given by Parker Anderson, extension forester of Minnesota, in the prairie region of western Minnesota.

In 1920 a cooperative windbreak project was started by the division of forestry of the University of Minnesota and the State Forest Service. At that time there was little interest in tree planting in the State, due largely to the many failures of early attempts to establish trees, particularly in the prairie region where windbreaks were most needed. From 1920 to 1926, about 260 demonstration windbreaks were established, most of which were successful. The work was taken over by the extension division in 1926, and a new type of shelter-belt planting was developed, which has become known as the Minnesota standard windbreak plan. This specifies a definite combination and arrangement of trees. Such rapidly growing species as poplar and willow form the outer rows, with conifers on the inside, and valuable hardwoods (and in southern Minnesota nut trees) between. The planting is so planned that not only protection against the prevailing north and west winds

but fuel wood, posts, lumber, and other wood products for farm use are eventually provided.

So satisfactory has this plan proved that commercial nurseries in Minnesota have adopted it and regularly carry planting stock of the necessary sizes and species. The growing appreciation of Minnesota farmers of the value of such windbreak plantings is shown by the fact that more than 60,000 trees a year were planted by them from 1926 to 1929, inclusive, the number increasing in 1930 to 90,000 and in 1931 to 170,000.

Plans for a New Arboretum

Formation of an arboretum comparable with the best in the United States is projected by the Arthur H. Scott Horticultural Foundation, according to the report of its director, John C. Wister. The expressed purpose of the foundation, which is connected with Swarthmore College, Pa., is "to help horticulture by visual demonstration which can be best realized by the planting in a public place of such trees, shrubs, and flowers as can be used by people of average means living in the Philadelphia district." The Scott Arboretum will occupy about 175 acres in Crum Creek Valley. Part of this land contains virgin timber and part is uncultivated river silt. Plans call for a division of the arboretum into four sections which will contain: Plants, shrubs, and trees native to Delaware County, Pa.; trees native to Pennsylvania but not native to Delaware County; plants and trees native to North America; and trees which grow in the same climate in other parts of the world.

A forest of more than 3,000 acres and securities valued at about \$200,000 have been bequeathed to the University of Virginia under the will of Dr. Walter M. Seward, of Brunswick County, Va. The land is to be used by the university for "practical demonstrations in the art of forestry" and the money "toward the maintenance and upbuilding of the school of forestry."

Seventeen forestry students from the University of Michigan spent a week on the Pisgah National Forest, April 14-21, under the leadership of Prof. L. J. Young. The trip, which has become an annual event for Michigan foresters, included visits to logging operations, recreation developments, research projects, and other national forest activities.

A course in aerial photography is being offered during the present semester at Harvard University. The latest photographic equipment, including a 5-lens camera, is being used.

Forest Service Notes

Copeland Report Outlines a National Program for Land Utilization

A land use program affecting more than a third of the entire land area of the United States is presented in the report prepared by the Forest Service in response to Senate Resolution 175 of the last session of Congress, introduced by Senator R. S. Copeland, of New York. The report presents a coordinated plan intended to insure all of the economic and social benefits which can and should be derived from productive forests by fully utilizing the forest land and by making all of its timber and other products and its watershed, recreational, and other services available to meet national requirements.

Main findings may be summarized as follows:

1. Practically all of the major problems of American forestry center in, or have grown out of, private ownership.
2. One of the major problems of public ownership is that of unmanaged public lands.
3. There has been a serious lack of balance in constructive efforts to solve the forest problem as between private and public ownership and between relatively poor and relatively good land.
4. The forest problem is one of our major national problems.

The report concludes that the only assured means to anything approaching a satisfactory solution of the forest problem are, first, a large extension of public ownership of forest lands, and, second, more intensive management on all publicly owned lands. It is therefore recommended that public agencies should acquire 224,000,000 acres of forest land, including a part of the abandoned agricultural land now available, and place it under forest management at the earliest possible date following acquisition. A considerable part of this land has or will come into public ownership in any event by reason of tax delinquency, according to the report. The States and their local subdivisions should take over as much of this acquisition program as their resources permit. The Federal Government should assume only that part which the States cannot carry.

Other recommendations include the placing of an additional area of 191,000,000 acres under fire protection and raising the standards of protection on much of the 321,000,000 acres now under protection; planting at least 25,000,000 acres during the next 20 years; raising the area under intensive forest management during the next few decades to at least 70,000,000 acres and preferably to 100,000,000 acres, and the area under extensive management to at least 279,000,000 and preferably to 339,000,000 acres.

In his letter transmitting the report to the Senate, Secretary Henry A. Wallace says in part:

The solution [of the forest problem] is the only means to stable, permanent forest industries, with a predepression value including forests of \$10,000,000,000 and gross products prior to 1929 of nearly \$2,000,000,000. This is also true of industries using forest resources other than timber and of a large group of other industries dependent on both.

The solution will provide an important source of employment for labor at a time when the development of labor-saving machinery makes employment a critical national problem. Our forest land in productive condition and the dependent primary forest industries alone would furnish employment for 2,000,000 men.

The solution offers an important aid in public finance by increasing the amount of taxable property. * * * [Pulp and paper mills, for example, depend on productive forests for their existence.]

It offers one important means for maintaining a balanced rural economic and social structure in the parts of the country which will grow timber, by utilizing all of the land productively for the purposes for which it is best suited, maintaining industries in perpetuity, and holding a reasonable part of the population in the country in a healthy, diversified rural life.

Programs for the various activities which make up forestry, such as protection against fire, insects, and disease; extensive and intensive forest practice; provision for watershed protection, recreation, forest wild life, and for the management and utilization of forest ranges have been worked out in as much detail as present information permits and incorporated in the national plan which forms an important part of the report on the Senate resolution. The Department endorses the recommendations for these programs.

Ninety percent of the total area of devastated and poorly stocked forest land and 95 percent of the current devastation is on privately owned forest lands, the report states. Forest deterioration, which is far more extensive and hence more serious than devastation, results from cutting without regard for future productivity of the forest, or from forest fires, or from the two combined. More than 99 percent of such cutting and 98 percent of the area burned annually is on private lands.

The public policy of passing excessive areas of forest land to private ownership and the private cut-out-and-get-out policy have wrecked or seriously reduced the productivity of the land, made it difficult or impossible to pay taxes, and hence have led to tax reversion so large in several forest regions as to constitute virtually a breakdown of private ownership. Stability of tenure is one of the essentials for timber growing.

Classing the airplane with the automobile as a disturber of the wilderness conditions to preserve which primitive areas have been set aside in the national

forests, the Forest Service has prohibited the landing of aircraft in these regions. In recreation areas and other parts of the forests where automobiles are admitted airplanes are not to be excluded, and landing fields may be constructed.

Newest Portable Radiophone Weighs Only 14 Pounds

By F. V. HORTON, United States Forest Service

A combined receiver-transmitter portable radiophone which weighs, complete with batteries, antenna, and all accessories, approximately 14 pounds has been developed in the North Pacific region of the Forest Service. Tests have recently been completed on the new sets and bids procured for their construction. They will be used by firemen and smoke chasers in national forests of the West during the coming fire season, particularly in regions 6 and 1.

The new small radio has a consistent sending range of about 15 miles by voice and a somewhat greater distance by code. It very nearly duplicates the performance of the 56-pound, 2-watt, semiportable radiophone also developed in region 6.

A third recent radio development in the region is a heavier set for semipermanent installation where alternating current is available either from regular power supplies or through the use of an independent generator driven by a gasoline engine. The maximum range of this set has not yet been determined, but it has been successfully used over distances of several hundred miles.

National Forest Changes

Transfer of the Kaibab National Forest, Ariz., from Forest Service region 4 to region 3, became effective April 1, 1933. No change was made in personnel or headquarters.

Reorganization of four national forests in western Washington has been approved by the Forester. It will involve the Mount Baker, Snoqualmie, Rainier, and Columbia National Forests and will result in the elimination of the Rainier, whose lands will be divided among the others. By Executive order of April 6, the Santiam and Cascade Forests in Oregon will be merged under the name Willamette, with headquarters at Eugene, Oreg., the order to take effect July 1, 1933.

A new national forest was proclaimed by the President on March 2, 1933. This is the Nicolet Forest in Wisconsin. It is at present in three units.

An area of 106,000 acres was added to the Wasatch National Forest, Utah, by Presidential proclamation of January 31, 1933. The addition contains about 300,000,000 board feet of lodgepole pine, spruce, and fir and includes the watersheds of three rivers.

Lands in Utah known as the Green River area were added by Presidential proclamation to the Ashley

National Forest on February 18, 1933. The new unit comprises a gross area of approximately 42,000 acres adjacent to the forest.

About 129,000 acres were added to the Gunnison National Forest, Colo., through an act of Congress approved by the President March 4. Approximately 150,000,000 board feet of merchantable timber is growing on the area. Another act approved March 4 added 640 acres to the Modoc National Forest, Calif.

Title to 7,431 acres of cut-over land within the St. Joe National Forest has been transferred to the United States through an exchange with the owners of the land, Potlatch Forests, Inc., for Government stumpage.

An Executive order of February 1, 1933, set aside an area of about 55,000 acres in Millard County, Utah, to be used by the Intermountain Forest and Range Experiment Station as a desert range experiment station. Nearly all the major vegetative types found in the desert area of western Utah and eastern Nevada are represented, and studies will be made to develop methods of grazing management best suited to this arid region.

Primitive and Natural Areas Recently Set Aside in National Forests

A tract of 62,600 acres in the Holy Cross National Forest, Colo., has been designated as the Maroon-Snowmass Primitive Area. It lies along the rugged Elk Mountain range which includes a number of peaks of approximately 14,000 feet elevation. About half of the area is above timber line. Maroon Peak, 14,126 feet above sea level, is the highest point. Snowmass Lake in this region is one of the most beautiful Alpine lakes in the United States.

In the Flathead National Forest, Mont., a 625,000-acre tract of wild country constitutes the recently established South Fork Primitive Area. Forty-five miles long and with an average width of 20 miles, the area is one of the largest so far designated in this category. It is bounded on the east by the Continental Divide and on the west by the Swan Mountains, and includes the headwaters of the South Fork of the Flathead River. Trails traverse the region, but there are and will be no roads. There is an abundance of game, including elk, deer, and bear, and the streams offer notable attractions to the fisherman.

An area of 277 acres in the Allegheny National Forest, Pa., has been designated the Heart's Content-Wilkins Farm Natural Area. The Heart's Content tract includes 20 acres of virgin white pine and hemlock, donated by the Wheeler & Dusenbury Lumber Co., and 101 acres surrounding it, also largely of virgin timber, purchased by the Government. In presenting the 20 acres, which includes Heart's Content Spring, an attraction to visitors for generations, the company was actuated by a desire to preserve, for the inspiration and enjoyment of the public, the

best remaining example of the once famous Pennsylvania white pine and hemlock forest. These lands will be used as a laboratory for the study of virgin forest conditions. The Wilkins Farm portion of the natural area is a tract of 156 acres adjoining Heart's Content on the west and north, chiefly open and cut over, purchased and donated to the Government by the Pennsylvania State Federation of Women's Clubs to prevent possible commercial development of an objectionable character and to provide for public use and recreation not desirable within the virgin area.

Defect in Ponderosa Pine Logs

By QUINCY RANGLES, United States Forest Service

A study of 47,800,950 board feet of timber scaled in a logging operation on the Sitgreaves National Forest in Arizona showed 4,834,180 board feet of defect, an average defect percentage of 10.11. Timber from parts of 37 sections in 5 townships was included in the study, considerable variation being found as between sections. Defect percentages varied between 5.31 and 16.54.

Logging operations in Arizona are confined almost entirely to virgin stands of pure ponderosa pine. These stands are in small, even-aged groups. The cut comes from the overmature and mature classes for the most part, but the stand is put in good silvicultural condition by the additional removal of the diseased, defective individuals of younger merchantable-sized trees. The timber removed in logging virgin stands carries considerable defect, due to rot and, to a less extent, to losses of merchantable volume from lightning wounds, fire scars, and deformities. Logs and portions of trees that under the terms of the sale agreement are not merchantable on account of defects are left in the woods. An otherwise merchantable log containing 50 percent or less rot is classed as merchantable and the proper deduction made in the scale.

New Planting Tool Developed by Gemmer

A planting tool that can be easily transported and used by one man has been developed by E. W. Gemmer of the Southern Forest Experiment Station. It has a tapered blade 10 inches long, 2 to 3 inches wide, and three fourths inch thick, with a stock 5 inches long having a pistol grip. It weighs slightly more than 5 pounds. The sharpened point is of tempered steel. The weight of the tool and the shape of the blade enable the user to make clean holes in the ground 10 to 12 inches deep and to close them easily.

Originally designed to meet conditions in the South, the tool should prove equally successful for the 1-man crew in planting operations in any part of the country. During January 1933 in the Choctawhatchee National Forest, Fla., more than a thousand seedlings were suc-

cessfully planted with it under a variety of conditions. The rate of planting was close to 500 trees per man in an 8-hour day; the maximum number planted by a 2-man crew with a large planting bar was 750.

Peat Mats for Germination Tests of Forest Tree Seeds

By PHILIP C. WAKELEY, United States Forest Service

A form of peat variously known as "peat moss," "acid peat," and "florists' peat" gives promise as a medium for testing the germination of seeds of various forest trees. At the Southern Forest Experiment Station, the peat, compressed into mats or blocks with grooves on the upper surface to receive the seeds, has proved a valuable supplement to, and a possible substitute for, the cumbersome sand flats ordinarily used for germination tests of the seeds of southern pines. In the tests so far made, the peat mats have given more prompt results than the sand flats and, usually, higher final germination.

The mats occupy only one fifth or one sixth of the laboratory space required by sand flats, and their use does not involve introducing grit or sand among laboratory apparatus. In 2 parallel series of 9 tests each, run for 50 days, the actual manipulative time of the series on peat mats, including final cutting tests, was only 85 percent of that required for the series in sand flats. Like sand flats, the peat mats are adapted to the testing of large seeds for which Jacobsen germinators are not suitable. Adequate moisture is more readily maintained in the mats than in the sand flats. Seeds set to germinate on peat are less subject to mold than those set up on paper or cloth substrata.

The germination of many kinds of seeds is hastened and improved by stratifying the seeds in moist peat, at low temperatures, for a month or two before testing.¹ The mat to be used for the germination test may also be used for stratification, thus eliminating the transfer of moist seeds from one medium to another. The seeds are counted while still dry and easily handled, set up on the mat in position for the germination test, refrigerated for the desired period, and removed to the germination room without further manipulation.

The peat mat used by the station is 19 by 19 cm square by 2 cm thick, and fits loosely into a square glass baking dish which is covered by a pane of ordinary window glass during the test. The mat is molded on a form consisting of 10 triangular wooden strips 17.7 cm long, 6 mm wide at the base, and 4 mm from base to apex, tacked on a board parallel to each other and 1.6 cm apart from apex to apex. A square frame or collar of galvanized screen wire, 2 cm deep and 19 cm on a side, is held in position around the block of strips by four headless nails driven vertically into the board.

¹ Barton, Lela V.: Hastening the Germination of Southern Pine Seeds. *Journal of Forestry* 26(6):774-785, illus. 1928.

Around this wire frame a snugly fitting square wooden frame is slipped to keep the wire from bulging. Moistened peat is packed into the frame and down upon the triangular strips, and is compressed with the hands into a firm mat 2 cm deep. The apparatus is inverted, the board with the strips is gently lifted off, and the completed peat mat and its wire border are carefully pushed out of the square frame into the glass dish. The triangular strips leave what is now the upper surface of the mat marked with 10 equally spaced grooves or drills, in each of which 25 to 50 seeds, depending on size, may be planted.

By keeping a trace of free water in the bottom of the dish at all times it is possible to maintain nearly ideal moisture conditions at the top of the mat throughout the tests.

Ponderosa Pine Makes Rapid Volume Increase After Cutting

By QUINCY RANGLES, United States Forest Service

An increase of 78 board feet per acre per year was recorded on an area of timberland in the ponderosa pine type in New Mexico between 1923 and 1932. At the time of cutting (1923), the reserved stand, consisting of ponderosa pine, Douglas fir, and white fir, was cruised and showed a net volume per acre of 1,123 board feet. In 1932 the volume per acre had increased to 1,830 board feet. This rather large increase in volume is made up by the total volume of new trees becoming of merchantable size during the period plus the increase in the merchantable-sized trees reserved at the time of cutting. In 1923, timber stands were marked heavier than is now the practice; however, there was a good stand of seedlings, saplings, and poles left on the area at time of cutting. Almost the entire area is now reported to be fully stocked.

The change in the number of trees per acre by species and by broad diameter classes is shown in the following table:

Diameter classes (inches)	Number of trees per acre					
	Ponderosa pine		Douglas and white fir		Totals	
	1923	1932	1923	1932	1923	1932
12 to 20.....	10. 195	14. 367	0. 805	1. 894	11. 000	16. 261
20 to 27.....	. 881	1. 191	. 003	. 137	. 884	1. 428
28 and more.....	. 081	. 131	. 001	. 050	. 082	. 181
Total.....	11. 157	15. 689	. 809	2. 081	11. 966	17. 870

This table shows an increase of 5.9 trees per acre of more than 12 inches in diameter during the period and a gratifying diameter increase in the broad diameter classes.

National Monument to Preserve Giant Cactus

A national monument created to preserve a representative stand of desert flora, including especially the giant cactus, or saguaro, has been placed under the administration of the Forest Service. The area, named the Saguaro National Monument, comprises about 60,000 acres on the slopes of the Santa Catalina Mountains about 25 miles northeast of Tucson, Ariz., and mainly within the Coronado National Forest.

Some of the specimens of saguaro on the area are believed to be more than 100 years old. The huge fluted green columns are sometimes 60 feet high and in May are crowned by creamy white blossoms. The fruit is palatable and is used as a food by Indians.

General Forest News

The Emergency Conservation Program Gets Under Way

"An act for the relief of unemployment through the performance of useful public work and for other purposes" was approved by President Roosevelt March 31, 1933. Its purposes are clearly indicated in the act itself, by which the President is authorized, "for the purpose of relieving the acute condition of widespread distress and unemployment now existing in the United States, and in order to provide for the restoration of the country's depleted natural resources and the advancement of an orderly program of useful public works, * * * under such rules and regulations as he may prescribe and by utilizing such existing departments or agencies as he may designate, to provide for employing

citizens of the United States who are unemployed, in the construction, maintenance, and carrying on of works of a public nature in connection with the forestation of lands belonging to the United States or to the several States which are suitable for timber production, the prevention of forest fires, floods, and soil erosion, plant pest and disease control, the construction, maintenance or repair of paths, trails, and fire lanes in the national parks and national forests, and such other work on the public domain, national and State, and Government reservations incidental to or necessary in connection with any projects of the character enumerated, as the President may determine to be desirable: *Provided*, That the President may in his discretion extend the provisions of this act to lands owned by counties and municipalities and lands in private ownership, but only for the purpose of doing thereon such kinds of cooper-

ative work as are now provided for by acts of Congress in preventing and controlling forest fires and the attacks of forest tree pests and diseases and such work as is necessary in the public interest to control floods. The President is further authorized, by regulation, to provide for housing the persons so employed and for furnishing them with such subsistence, clothing, medical attendance and hospitalization, and cash allowance as may be necessary, during the period they are so employed, and, in his discretion, to provide for the transportation of such persons to and from the places of employment. That in employing citizens for the purposes of this act no discrimination shall be made on account of race, color, or creed; and no person under conviction of crime and serving sentence therefor shall be employed under the provisions of this act. The President is further authorized to allocate funds available for the purposes of this act, for forest research, including forest products investigations, by the Forest Products Laboratory."

In setting into motion machinery to carry out the law, President Roosevelt issued on April 5 an Executive order with the following provisions:

(1) For the purpose of carrying out the provisions of said act Robert Fechner is hereby appointed Director of Emergency Conservation Work * * *.

(2) The Secretary of War, the Secretary of Agriculture, the Secretary of the Interior, and the Secretary of Labor each shall appoint a representative, and said representatives shall constitute an advisory council to the Director of Emergency Conservation Work.

(3) There is hereby established in the Treasury a fund of \$10,000,000 by the transfer of an equal amount from the unobligated balances of the appropriation for emergency construction of public buildings contained in the act approved July 21, 1932, as authorized by section 4 of the said act of March 31, 1933, which fund shall be subject to requisition by the said Robert Fechner, as Director of Emergency Conservation Work, on the approval of the President.

(4) Subject to direction by the President, supplies and materials of the several departments or establishments shall be furnished on the requisition of the Director of Emergency Conservation Work, and the departments and establishments furnishing such supplies and materials shall be reimbursed therefor in accordance with instructions of the President.

(5) Reimbursement, if any, to the departments or establishments for other services rendered shall be made in accordance with instructions of the President.

It is provided in the law that the authority granted the President therein shall continue for a period of not longer than two years.

The Labor Department is in charge of the enrollment of the 250,000 men to be employed under this legislation. Each State is assigned a quota. The men are selected by the State official in charge of unemployment relief from the existing lists of applicants for work or relief. Until these lists are exhausted no further applications will be received. The work is to be given first to men between the ages of 18 and 25 who are citizens of the United States, unmarried and unemployed, who wish to allot a substantial part of their \$30

a month compensation to their dependents. In addition there will be selected a certain number of older men, married or unmarried, who live near the national forests or national parks, are unemployed, and who have had actual experience in work in the forests.

After enrollment, which is for a 6-month period, the men are sent to Army recruiting stations where they are given a physical examination before they are finally accepted. Those accepted are sent on to a War Department concentration camp for a 2-week period of conditioning. This consists of setting-up exercises, hikes, and some manual labor. Here the men are also instructed to some extent in the work they are to do in the forests. The Army will also furnish the camp equipment, the supply service, and the management for the forest camps.

In the national forests the work will be under the supervision of the Forest Service of the United States Department of Agriculture. In national parks the National Park Service of the Department of the Interior will be in charge. The men will work 8 hours a day (including travel to and from work and the lunch period) for 5 days a week. Projects include making trails, paths, minor roads, and firebreaks; improvement of timber stands by thinning; tree planting; timber surveys; development of public camp grounds; construction of range fences; elimination of fire hazards; construction of telephone lines; eradication of tree pests and diseases; construction of fire towers and shelters; and landscaping in park areas. The men will also be subject to emergency calls at any hour of the day or night to fight forest fires. None of this work is "made work" intended merely to keep men busy. It is all necessary public work which will help put the forests in a productive condition that would ordinarily have taken decades to attain.

Sites for camps in national forests were the first to be approved. Fifty sites, all in region 7, were approved April 12; 57 more, in regions 7 and 9, were approved April 19. On April 20, the number of camp sites approved brought the total number to be established in national forests to 645, of which 538 will be in 12 Western States. The number of camps to be established in each State is as follows:

Alabama, 3; Arizona, 28; Arkansas, 12; California, 166; Colorado, 30; Florida, 3; Georgia, 5; Idaho, 100; Louisiana, 2; Maine, 1; Michigan, 10; Minnesota, 15; Mississippi, 2; Montana, 25; Nevada, 4; New Hampshire, 6; New Mexico, 23; North Carolina, 10; Oklahoma, 1; Oregon, 65; Pennsylvania, 5; South Carolina, 1; South Dakota, 13; Tennessee, 7; Utah, 20; Vermont, 2; Virginia, 10; Washington, 42; West Virginia, 7; Wisconsin, 5; Wyoming, 22.

On April 6, in response to telegrams sent to the governors of States by Secretary of Agriculture Wallace, State foresters, conservation commissioners, and others representing the governors met in Washington for a conference to formulate plans for utilizing part of the 250,000 men on State lands. Such work as may be

undertaken on State and private lands will be administered by State agencies, usually the State foresters. Fifty-four camps have been approved in the State forests of Pennsylvania. A total of 350 camps on State and private lands has been recommended.

The regional foresters of the nine national forest regions have been specially designated to cooperate with the War Department, to approve project plans, and to requisition men and equipment for the camps on national forests. To perform these same functions in connection with the work on State forest lands District Forest Inspectors G. T. Backus, E. M. Bruner, H. J. Eberly, C. F. Evans, and C. R. Tillotson have been appointed in their respective Forest Service Clarke-McNary inspection districts.

In addition, the following men have been appointed representatives of the Director of Emergency Conservation to act as liaison officers at the headquarters of the various Army Corps Areas: F. L. Haynes, in charge of acquisition for the Massachusetts department of conservation, First Corps Area, Boston, Mass.; Nelson Brown, professor of forest utilization, New York State College of Forestry, Second Corps Area, Governor's Island, N.Y.; F. W. Besley, State forester of Maryland, and K. E. Pfeiffer, assistant State forester of Maryland, deputy, Third Corps Area, Baltimore, Md.; W. P. Kramer, assistant supervisor of the Pisgah National Forest, Fourth Corps Area, Atlanta, Ga.; L. F. Kellogg, of the Central States Forest Experiment Station, Fifth Corps Area, Columbus, Ohio; John McLaren, regional forest inspector, region 9, Sixth Corps Area, Fort Sheridan, Chicago, Ill.; H. D. Cochran, assistant chief of forest management, region 2, Seventh Corps Area, Omaha, Nebr.; John D. Guthrie, assistant regional forester, region 6, Eighth Corps Area, Fort Sam Houston, San Antonio, Tex.; and C. B. Morse, assistant regional forester, region 4, Ninth Corps Area, the Presidio, San Francisco, Calif.

Is Nicotine Good for Seedlings?

By R. S. MADDOX, Assistant Forester, Virginia

During my connection with the State forestry work in Tennessee, I noticed that in the western part of the State, where dark tobacco is grown, small grain such as rye, wheat, and oats thrived better on bare fields from which tobacco had been harvested than on adjacent areas which had not contained tobacco. (These fields are referred to as "bare" because tobacco is usually cultivated so free from weeds and grass that after the crop is harvested little or no vegetation is left except stubs of tobacco stalks and their roots.) It was also observed that portions of grain fields and lawns about dwellings in Tennessee produced more luxuriant growth where tobacco stalks had been spread than elsewhere. In view of these observations it occurred to me to experiment with nicotine on young trees in the nursery.

On July 7, 1932, two sections of a bed of young hemlock in the Virginia nursery that had germinated during April and May were treated with different forms of nicotine. The bed was 100 feet long by 4 feet wide, and each treated section was 12½ feet long. A small parcel of tobacco leaves was dried and crumpled into small particles. One section was spread with one fifth of a pound of these crumpled leaves and immediately sprinkled with water; the other was sprinkled with 4 gallons of water containing 2 teaspoonfuls of Black Leaf 40, a nicotine sulphate solution.

In the fall the two treated sections each contained two or three times as many trees as the untreated sections of the 100-foot bed, and the trees were thriftier. The soil of the entire bed when planted was, as nearly as I could determine, of the same consistency, fertilizer and seed were equally distributed, and the same cultivation and attention were given during the year except for the special treatments. There was no variation between the two sections because of the different methods of application of the nicotine.

Similar treatments were applied to arborvitae, Scotch pine, and Norway spruce, with no distinguishable results. Whether the better growth of the two groups of hemlock seedlings was due to the nicotine or just happened cannot be definitely decided without further experimentation. Perhaps an earlier application of the tobacco would have given a better opportunity for a conclusive determination.

Salt Spray Damages Vegetation on Cape Cod

By RALPH C. HALL, United States Bureau of Entomology

A northeastern gale that struck Cape Cod on September 8, 1932, deposited salt spray from the Atlantic Ocean on vegetation as far back as 6 miles from the coast, killing many plants, including trees. The wind, the velocity of which was estimated at 65 miles per hour at the Chatham Coast Guard Station and at 75 miles per hour at the Wood End Coast Guard Station, carried the spray over the entire land area of the cape. Though accompanied by only a small amount of rain, the storm was the worst in many years. Three and a half miles from the ocean, the windows of Shoot Flying Hill lookout tower were clouded with salt, according to Sam King, forest fire patrolman.

Soon after the storm, all the vegetation on the north and east shores of the cape within several hundred yards of the ocean turned brown. The leaves of practically all plants were killed, with the exception of those of pitch pine. Woody plants, including poison ivy, bayberry, beach plum, sweet fern, hog cranberry, blueberry, and huckleberry, appeared to be about equally affected by the salt spray. The pitch pine needles showed a slight burning at the tips on trees adjacent to salt water, but trees at a distance greater

than half a mile were not affected. The most severe damage to pitch pine foliage was noted north of Provincetown near Race Point, where trees exposed on the north or east showed considerable burning. Leaves of the apple seemed to suffer more than those of any other species; practically all the foliage in an apple orchard 6 miles from salt water was completely killed. Shade-tree elms suffered considerable damage up to a distance of 2 miles from the sea, dropping practically all their foliage within a week.

The storm did an enormous amount of damage to cultivated flowering plants all over the cape, especially in the near vicinity of the ocean. One landscape gardener at Chatham lost his entire gladiolus crop through the burning effect of salt spray.

Of the conifers observed (Scotch, white, Norway, and pitch pines, Norway spruce, and larch), the white pine appeared to suffer the greatest amount of damage to its foliage. Several instances were noted where white pines at distances as great as 5 miles from the ocean showed some burning on the northeast side of the trees.

Occurring as it did near the end of the growing season, the storm caused less serious damage than it would have earlier in the summer. Such a storm is too unusual an occurrence to be considered as a factor seriously affecting deciduous growth. During the winter months severe storms of this kind are frequent, but their effects would be apparent only on conifers. All over the cape may be seen dominant white pines with their tops dead down to the surrounding tree growth. It is possible that the salt spray carried by these winter storms has been a contributing factor in the death of the tops of these trees, since white pine shows low resistance to salt burning.

Entomological Factors Affect Salvaging of Fire-Injured Trees

By KENNETH A. SALMAN, United States Bureau of Entomology

The results of a study of 148 selected fire-injured ponderosa pines recently completed by the Bureau of entomology in the Modoc National Forest, Calif., may prove of considerable aid in future marking of fire-injured trees for salvage. The record was taken on the site of the Sugar Hill fire of July 1929 during the 4 years 1929-32 and covers the time of readjustment and recovery following the fire injury. Although the stand remaining after any fire will present conditions peculiar to the particular situation and will require special treatment, some conclusions resulting from the study may be of general application.

Mortality of fire-injured trees from insect attack was found to be greatest during the first and second years following the season in which the fire occurred. A resumption of more nearly normal conditions of insect activity was observed in the stand during the third year after the fire.

The types of fire-injured trees that should be marked for salvage on any given fire area will depend to a large extent on the material that is left on the area. Trees that have suffered 100 percent defoliation and also have had most of the buds killed will succumb without further injury by insects and should be salvaged. Trees that have suffered no fire injury should not be cut unless the lumbering operation is directed toward harvesting the stand in addition to the salvage of injured material.

Fire-injured trees that might survive if not attacked by insects have, according to the results of the study, different degrees of susceptibility to insect attack. Mortality due to the western pine beetle (*Dendroctonus brevicomis* Lec.), the species chiefly responsible for the insect damage to trees in the area studied, varied significantly with the amount of foliage injury and more particularly with the amount of cambium injury caused by the fire. When foliage injury alone occurred, trees having 0 to 25 percent of the foliage injured lost only 8.7 percent of the total number of trees in that class, while those having the same amount of foliage injury but relatively heavy cambium injury suffered a 10 percent loss. In the group of trees with 25 to 50 percent foliage injury, those with slight cambium injury lost 3.6 percent, while those with moderate to heavy cambium injury suffered a loss of 13.3 percent of the total. In the group with 50 to 75 percent foliage injury the loss was 18.2 percent for those without cambium injury and 37.5 percent for those with that type of injury. The most severely injured group studied—that having 75 to 100 percent of the foliage and a small proportion of the buds killed—lost 19.2 percent of the total number of trees in the class, while those with cambium injury in addition to the foliage injury lost 72.2 percent.

The relative probability of recovery without insect attack is indicated by the following list, which progresses from the least susceptible type to the most susceptible:

- 0 to 25 percent defoliation, no or slight cambium injury.
- 25 to 50 percent defoliation, no or slight cambium injury.
- 0 to 25 percent defoliation, moderate to heavy cambium injury.
- 25 to 50 percent defoliation, moderate to heavy cambium injury.
- 50 to 75 percent defoliation, no or slight cambium injury.
- 75 to 100 percent defoliation, no or slight cambium injury.
- 50 to 75 percent defoliation, moderate to heavy cambium injury.
- 75 to 100 percent defoliation, moderate to heavy cambium injury.

Although the severity of the injury and the number of trees left on the area determine to a great extent

the types of fire-injured trees that should be salvaged, the results of this study indicate that in general it would pay to salvage the following classes, as the chances are great that otherwise they will succumb to insect attack:

Trees having more than 50 percent defoliation and moderate to heavy cambium injury; and trees having 75 to 100 percent foliage injury and no or slight cambium injury.

The salvage of trees having 50 to 75 percent foliage injury but no or slight cambium injury, and those with 25 to 50 percent foliage injury with moderate to heavy cambium injury would depend on the number of trees to be left for reseeding the area. Unless an unusually heavy stand of fire-injured trees in the less seriously injured groups is left by the fire, it would not pay to harvest individuals in these groups.

Principal Recommendations of Nancy Forest Research Congress

Among the recommendations of sections and committees adopted by the plenary session of the Congress of the International Union of Forest Research Organizations held in Nancy, France, in September 1932, those on the following subjects are of particular interest to American foresters:

Unification of descriptions of forest stands.—A committee of three members was appointed to study this subject and to develop unification in methods of forest research.

Origin of forest tree seeds.—Research stations are to continue to exchange seeds for scientific purposes through the secretariat general of the Union. Governments will be requested to adopt international standards for guaranteeing the control and origin of seeds.

Methods of testing forest tree seeds.—The international committee is to consider the advisability of holding a symposium at the next congress in which each country or State would briefly describe the best methods of testing forest tree seeds used in that country, together with suggestions as to the effectiveness of the methods employed.

Expansion of national parks.—"Biologists generally recognize the value of areas of natural vegetation, especially of virgin or natural forest stands, in indicating the development and working of natural laws and principles in biology. It is therefore urged that the constituent members of the congress use their influence to obtain the reservation of natural stands of forest adequate to portray the development and working of the natural laws and principles in the different types of forest in the various countries of the world."

Wood tests.—In view of the great variety of methods now applied in physical and mechanical tests of woods, which render it difficult to compare the results of tests made in different laboratories, the matter of unification

of methods and presentation in figures of the results will be made a subject of study in the various research organizations of the Union and will be submitted for discussion to the next congress for the purpose of arriving at a standardization of methods.

Study of root systems.—Special attention should be given by the various stations to the morphological, physiological, and ecological study of the root systems of the species forming the principal types of forest vegetation, particularly in arid, subtropical, and tropical regions.

Nomenclature of humus layers.—Two principal types of humus are to be recognized hereafter—mull and raw humus. Mull has but one layer with two subtypes, real mull and surface mull. Raw humus consists of two layers: a fermentation layer, and a humified layer which can itself be subdivided into fine humus, greasy humus, and fibrous humus.

Podsolized soils.—A committee of 11 members was appointed to study podsolized soils, especially those which have a layer of hardpan, to determine the most suitable methods for assuring their use.

The next congress is scheduled to be held in Hungary in 1936.

Redwood Has Few Insect Enemies

By HUBERT L. PERSON, United States Forest Service

In this age of insects, the redwood (*Sequoia sempervirens*) compared with other tree species is remarkably free from this form of attack. There are no so-called primary insects which attack this species seriously, and it is doubtful if any redwood tree has ever been killed by insects alone. This relative immunity probably contributes to no small extent to the longevity of the species. A few insects of minor importance, however, are known to feed upon the foliage, the bark, the bark and wood, or the wood of the redwood tree.

Of these groups, the bark and wood feeders are probably of most importance. Two bark beetles of the family Scolytidae mine the cambium and the outer sapwood of the branches of injured trees and occasionally assist in the killing of parts of a weakened redwood tree. Both species belong to the genus *Phloeosinus*, the most common being *P. sequoiae* Hopk. and the other *P. cupressi* Hopk.

The only other insect which feeds on the bark or cambium of living trees is the redwood pitch worm, one of the Lepidoptera. The species is *Vespa mima sequoiae* Hy. Edw., and the adult resembles a yellow jacket. The larvae are a yellowish white and bore through the cambium of the branches, usually around the nodules, forming a pitch mass and often killing the outer part of the branch. This damage is probably not very common.

There are a number of the Coleoptera and one of the Hymenoptera which bore in the sapwood or heartwood of dead redwoods. Included in this group are two

ambrosia beetles (*Gnathotrichus retusus* and *G. sulcatus* Lec.); one buprestid, the common anthaxia (*Anthaxia oeneogaster* Castelnov and Gary); five cerambycids—the redwood borer (*Judolia impura* Lec.), *Stranglia oblitterata* Hald., *Leptura maltheusii* Lec., *Semanatus lignea* Fabr., and *Phymatodes nitidus* Lec.; and the western horntail (*Sirex areolatus* Cresson).

There are also a number of insects which feed on the foliage of living redwoods, but fortunately none of them have ever been known to injure the trees at all seriously. The most important member of this group is the redwood scale (*Aonidia shastae* Coleman). Ferris has reported this species as occasionally abundant on redwood foliage. The ivy or oleander scale (*Aspidiotus hederae* Vallot), and the black araucaria scale (*Chrysomphalus rossi* Maskell) are also found on redwoods at times. Some of the mealy bugs, especially the cypress and redwood mealy bugs (*Pseudococcus ryani* and *P. sequoiae*) also feed on redwood foliage, as does the redwood chafer or June beetle (*Dichelonyx valida*).

The following are good reference works on redwood insects:

Essig, E. O.: Insects of Western North America. 1,035 pp., illus. New York, The Macmillan Co. 1926. (See host list, p. 931, Redwood.)

Keen, F. P.: Bark Beetles of the Family Scolytidae. Mimeographed. (Copy can be obtained from J. M. Miller, 341 Giannini Hall, University of California, Berkeley.)

Hopkins, A. D.: Insect Enemies of the Redwood. U. S. Bureau of Forestry Bulletin 38, pp. 32-40. 1903.

How Soon After a Fire Can Damage be Estimated?

It has long been realized that the damage resulting from a forest fire cannot be accurately estimated immediately after the fire except where destruction is complete. To determine how much time should elapse before a reliable estimate can be made, studies of experimental burns were conducted in 1931 and 1932 at the Michigan Forest Fire Experiment Station in cooperation with the Lake States Forest Experiment Station of the United States Forest Service. Results indicate that 3 to 4 months should elapse after a fire before damage estimates are made.

In making the study, repeat tallies at intervals of 1 month, 3 to 4 months, and 12 to 17 months were made on a number of fires in jack pine at the station. All plots tallied a month or less after burning showed heavy losses in all of the smaller sizes of trees, while the plots checked 3 to 4 months after burning showed little or no later loss.

As a rule, jack pines less than 2 feet high die at once if damaged at all, while those larger than 4 inches in diameter breast high recover if not completely scorched.

Pines between these two size classes usually die if 90 percent or more of the crown is killed. It would appear that mortality is due primarily to crown damage, since in no case was death traceable to butt injury alone except where the tree was mechanically weakened by repeated burning until it broke off or blew down.

These conclusions apply only to jack pine, since fire resistance is not the same in all species.

Death Valley Now a National Monument

Death Valley, the lowest point in the United States, has become a national monument under the National Park Service of the Department of the Interior by Presidential proclamation. The area of the new monument is approximately 1,601,800 acres.

In spite of its name, this region is rich in plant life, nearly 500 species having been found there including the cactus, the yucca palm, the chuckwalla, a variety of spring flowers, and a few rare plants which grow nowhere else.

A species of mountain sheep inhabiting the valley closely resembles the Rocky Mountain species whose habitat is above timber line. Pocket mice and kangaroo rats are also common.

The vertical rise from the floor of the valley, which according to the United States Geological Survey is 276 feet below sea level, to the top of Telescope Peak, 11,045 feet high, also included in the monument, is the greatest in the continental United States. There are evidences of volcanic upheavals and of former extensive lake beds in the valley. Borax, niter, and potash are present in large quantities.



The use of sodium arsenite as an effective tree killer has been rendered much easier through the invention of a 1-man tool which operates as easily and effectively as an axe. Further information concerning this tool, which is being manufactured in central New York, can be obtained from J. A. Cope, Cornell University, Ithaca, N.Y.



By presidential proclamation, 273,145 acres adjoining the Grand Canyon National Park and the Kaibab and Tusayan National Forests were recently withdrawn to form the Grand Canyon National Monument, which will be under the administration of the National Park Service. The area lies largely north of the Colorado River but includes a small block of public lands south of the river between the Tusayan Forest and Walpais Indian Reservation. The new monument is about 50 miles below the point from which the canyon is most commonly viewed, but provides a number of equally fine views of the canyon and of the river 3,000 feet below.

Foreign Notes

● The Part of Forestry in the Reclamation of Palestine

By BERNARD FRANK, United States Forest Service

In the program for restoring Palestine to economic productivity, 7,500 acres of hilly, rocky land, unsuitable for crop production, is scheduled for afforestation. About 1,500,000 trees have already been planted on some 1,700 acres of this area, which will be covered with forests as fast as money becomes available from the income of the "tree fund" to which Jews throughout the world are voluntarily contributing. The following description of the afforestation activities in Palestine is based on a letter from Dr. Joseph Weitz, director of the afforestation department of the Agricultural Experiment Station of the Zionist Organization, written in response to my request for specific information on the subject:

The land which has been afforested or is reserved for afforestation is rough and rocky. The rocks are generally of lime formation. The soil is shallow, sometimes occurring in layers of only 12 to 14 inches. It is reddish in color when very loamy and grayish-white when rich in lime.

The rainfall during the 6-month rainy season, November to April, averages 18 to 21 inches. During the rest of the year there is no rain whatever, but occasional dews occur. The soil, if it is cultivated and a mulch formed on the surface, possesses the ability to retain humidity during the summer.

Both evergreen and deciduous species are employed for planting, the former being considered the more important. The evergreens are, in order of their importance: *Pinus halepensis*, *P. pinea*, *Cupressus pyramidalis*, *C. horizontalis*, *C. macrocarpa*, *Ceratonia siliqua*, *Acacia cyanophylla*, and *A. longifolia*. The deciduous species are *Ailanthus glandulosa*, *Melia azedarach*, *Robinia pseudoacacia*, *Morus alba*, and *M. nigra*. About 80 percent of all the trees planted are *Pinus halepensis*, a native species which adapts itself well to the differences in soil and climate of the country.

The evergreens are grown in local nurseries, the seed being sown in September in boxes containing suitable soil. Sprouting takes place in about one month, and by February the seedlings are ready to be planted in pots or tins. The latter are about 3 inches deep by 14 inches long and 8 inches wide, large enough for 12 plants. They are watered during the summer months. In December the seedlings are 8 to 14 inches high, with good branch development, and are ready for permanent planting.

The seeds of the deciduous species are sown directly in beds during February and March, with a distance between rows of 16 to 20 inches. They are watered

twice monthly and by December are 16 to 20 inches tall and ready for planting.

The afforestation sites are prepared by digging pits during October and November, before the rainy season begins. These pits are approximately 12 by 12 by 12 inches. Planting begins by the end of December, if 6 inches of rain has fallen. The evergreens are brought from the nurseries in the tins, taken out with the soil surrounding the roots, and placed in the pits. If the trees have been grown in pots they are taken out at the nursery, wrapped in paper, and packed in boxes, each box containing 150 to 200 trees. At the planting site they are taken out of the boxes, unwrapped, and planted. By February planting has been completed. Twice during the spring months the soil around the seedlings is hoed and all weeds destroyed. The deciduous trees are planted without earth balls and cared for in the same manner as the conifers.

As a general rule, 1,200 trees are planted per acre. The results depend chiefly on the amount of rainfall after February. If that is sufficient and the soil hoed in time, 85 percent survival is obtained. With insufficient rainfall survival may fall to 30 percent. The average survival has been 70 to 75 percent, and less than 70 percent is considered unsatisfactory.

Planting costs depend on the number of days required for the various operations. The afforestation work of the Jewish National Fund is carried out entirely by Jewish labor. The cost of producing 1,000 evergreen trees is estimated at £4 or £5. By planting the seeds direct in beds the cost can be reduced to £2 or £2½, but in that case the survival percentage is lower.

Under good conditions the native pine reaches in its sixth year a height of 10 to 13 feet and a diameter (1.6 feet above the ground) of 2¼ to 2½ inches. The *Ailanthus*, a rapid grower, reaches by the fourth year a height of 13 feet and a diameter of about 2½ inches.



The Institute for Foreign and Colonial Forestry, established at the Tharandt Forestry School in 1931 by the ministry of education of Saxony, Germany, is offering courses of instruction in forestry especially adapted for foreign students. A program of special lectures will be given during the summer term of 1933. Excellent facilities for research are offered by the institute, special work in allied subjects may be carried on in the Polytechnical University of Dresden (of which the forestry school is a division), and the school forest is at the disposal of students. Tours of forest regions of Germany or other European countries may be arranged. Detailed information can be obtained by addressing the institute at the Forstliche Hochschule Tharandt, Tharandt, Saxony, Germany.

Vast Land Improvement Project Under Way in Italy

A nation-wide development project known as "bonifica integrale" is in full swing in Italy, reports Arthur C. Ringland, European forestry specialist of the United States Forest Service. Through this great public work, all the land in that country is to be made to serve some useful purpose, directly or indirectly, and waste areas are to be completely eliminated. Plans include the control of mountain streams and run-off, checking of soil erosion on slopes, and irrigation and reclamation of all lands suitable to agricultural use. The purposes of the plan, as explained to Mr. Ringland by officials in Rome, are to redistribute the surplus urban population of Italy, provide employment for surplus labor, and to make Italy as nearly self-supporting as possible. Corrective work in the mountains, in which forestry plays an important part, is a basic phase of the problem.

The project is under the centralized direction of a special division in the Italian ministry of agriculture and forests. The original estimate of \$400,000,000 will probably be much exceeded as will also the time allotment of 14 years for completion and 30 years for liquidation. Work has been completed or is under way on 1,000,000 acres and \$150,000,000 has already been expended.

The improvement projects are carried out by the State or, more generally, by so-called "consortiums" of local landowners. These consortiums are formed where the owners of at least one quarter of the area involved request the cooperation and help of the State. Expropriation can be enforced if in the public interest. The consortiums are enabled to borrow money from the Government at 2½ percent to the amount of 55 to 87½ percent of the capital investment required upon the basis of plans approved by the ministry. No project is independent; every unit of the work is an integral part of the whole plan.

Forest Management Plans of Five Countries Published

Plans for the management of the forests of Belgium, France, Hungary, Switzerland, and the Province of Quebec, Canada, have been published by the International Institute of Agriculture as the first volume of a series undertaken in consequence of a resolution passed by the first Congress of Silviculture held in Rome in 1926. The institute was requested by this resolution to publish "a series of practical and exact examples of the management methods in use for the different types of forests, together with instructions on this subject from the various forest administrations of the world." This first volume will be followed by others containing the plans of other countries as they are submitted.

The introduction stresses the need of knowing and improving on means and methods capable of assuring the continuity of revenues from the forest. The tendency is noted in many countries to extend to private forests, in the public interest, legal requirements for management. For Belgium, France, and Hungary the legislative measures making obligatory the management of certain forests according to approved plans and the text of official instructions relative to management and revision of plans are quoted. For Hungary are given also the instructions relating to the fixation of boundaries and surveying of landed forest property as well as two practical examples of plans of management as used in that country for large and small forest areas. As an example of the requirements imposed by the cantons of Switzerland those of the Canton of Vaud are given.

The reports from the different countries are printed in full as submitted to the institute. The text is in French.

Personals

C. M. Granger, director of the Forest Survey of the United States Forest Service, has been designated by the Forester to take charge of the unemployment relief program as it affects the Forest Service.

Robert Fechner was appointed by President Roosevelt on April 5, 1933, Director of Emergency Conservation Work under the act for unemployment relief through forest work. Mr. Fechner is vice president of the International Association of Machinists and a lecturer on labor questions at Harvard and Dartmouth Universities.

Francis E. Williamson, Jr., forest ranger in charge of recreation, Mount Hood National Forest, Oreg., has been awarded the military decorations of the Purple Heart and the Silver Star for bravery in action during the World War.

George M. Gowen has been transferred from the California Forest Experiment Station to the Lassen National Forest, where he will succeed W. G. Durbin, retired, as supervisor. Mr. Gowen is a graduate of the California University School of Forestry. Entering the Forest Service in 1920, he has had wide experience in both administrative and research work in California.

Three national forest supervisors whose service began in the early years of the century were retired on March 1, 1933. They are William G. Weigle and Charles C. Hall, of region 6, and William G. Durbin, of region 5. Mr. Weigle, for the past 14 years supervisor of the Snoqualmie Forest, Wash., is a graduate of the Yale Forest School. His Forest Service record includes a year as assistant chief of the branch of forest management; the supervisorship of the Coeur D'Alene National Forest, Idaho; supervision of all Government forests in Alaska; and, since 1919, the supervisorship of the Snoqualmie. Since his retirement Mr. Weigle has become superintendent of State parks of the State of Washington.

Charles C. Hall began his career in 1906 as assistant forest ranger in charge of the third district of the Hell Gate Forest Reserve, Mont., under Supervisor E. A. Sherman. In 1907, he was promoted to be supervisor of the Hell Gate and Big Hole Forest Reserves. In 1910, he was transferred to region 3 and placed in charge of the Alamo Forest. He reorganized this forest, and was given a similar assignment on the Carson in 1911. In 1912, he was assigned to the Tonto Forest, becoming supervisor in 1913. In March 1916 Hall went to region 6 as supervisor of the Santiam, where he remained until his retirement.

W. G. Durbin entered the Forest Service in 1903 and after work as a cruiser and a ranger became assistant supervisor of the Plumas National Forest. He was then successively supervisor of the Plumas, the Modoc, and the Lassen, all in California.

Lithgow Osborne, publisher and editor, succeeds Henry Morgenthau, Jr., as Conservation Commissioner of New York. Mr. Morgenthau was appointed governor of the Federal Farm Board by President Roosevelt. John T. Gibbs, who has been secretary of the conservation department since October 1931 was named deputy commissioner.

Samuel A. York has been appointed State forester of Massachusetts to succeed W. A. L. Bazeley.

H. W. Shawhan was appointed on April 4, 1933, Chief Forester of the West Virginia Game, Fish, and Forestry Commission to succeed J. W. K. Holliday. Mr. Shawhan is a graduate of the Biltmore Forest School. He was for many years forester for the Ritter Lumber Co. in West Virginia.

Hugh P. Baker, president of the Massachusetts State College, received the honorary degree of doctor of laws from the New York State College of Forestry on February 23, 1933. The conferring of the degree followed exercises in the auditorium of the Louis Marshall Memorial Building at which the building itself was dedicated and presented to the college and Syracuse University.

K. S. Trowbridge, from January 1930 to June 1931 extension forester of Georgia and later special agent at

Darien, Ga., is now cooperative agent in naval stores for the Georgia Extension Service, with headquarters at the Georgia Coastal Plain Experiment Station, Tifton, Ga. His work is assisting naval stores' producers in their stilling problems and woods operations along lines recommended by the United States Bureau of Chemistry and Soils and the Forest Service.

Bonnell H. Stone, development agent for the Georgia Department of Forestry and Geological Development since its formation in January 1932 when the State Board of Forestry and the Geological Survey were consolidated, and prior to that time a member of the State Forestry Board, has been appointed extension forester of Georgia under a cooperative agreement between the Department of Forestry and the State Extension Service. DuPre Barrett will continue his work as extension forester for the University of Georgia, the State Department of Forestry, and the United States Department of Agriculture, but with his field restricted to the 48 counties in northern Georgia. Mr. Stone will have charge of forestry extension activities in the counties of central Georgia, with headquarters at Oxford, in Newton County. Extension work in the southern part of the State will be handled by K. S. Trowbridge in connection with his naval stores activities.

Rodney H. True, professor of botany and director of the botanical gardens at the University of Pennsylvania since 1920, has been appointed director of the Morris Arboretum, recently received by the university as a bequest from Miss Lydia Morris. Dr. True was at one time plant physiologist with the United States Department of Agriculture. Harlan H. York, of the faculty of botany of the university, formerly forest pathologist of the New York State Department of Conservation, has been appointed one of 4 members of the scientific staff of the arboretum. Dr. York will carry on research investigations in tree diseases. Other members of the staff are Edgar T. Wherry, ecologist; Conway Zirkle, geneticist; and John M. Fogg, Jr., taxonomist.

Officers elected for 1933-34 by the Allegheny section of the Society of American Foresters at its annual winter meeting held in Philadelphia, Pa., February 24-25, are: Karl E. Pfeiffer, assistant State forester of Maryland, chairman; William S. Taber, State forester of Delaware, vice chairman; H. F. Round, office of the forester of the Pennsylvania Railroad Co., secretary; and N. T. Kessler, assistant State forester of New Jersey, and A. C. McIntyre, of Pennsylvania State College, members of the executive committee.

The Appalachian section of the Society of American Foresters at its 1933 meeting elected C. F. Evans, district forest inspector of the United States Forest Service, chairman; F. H. Claridge, assistant State Forester of North Carolina, vice chairman; and I. H. Sims of the Appalachian Forest Experiment Station, secretary.

Eino Saari, professor of forest economics at the University of Helsinki, Finland, came to the United States in February for a period of study under a research fellowship in forest economics under the International Education Board of the Rockefeller Foundation. Professor Saari spent most of February and March at the Yale University School of Forestry. He plans to

visit various institutions in different parts of the country in order to acquire a first-hand knowledge of our economic problems.

Officers of the Angeles Forest Protective Association of southern California for 1933 are: H. W. Baker, president; Worthy White, first vice president; and Harvey S. Bissell, second vice president.

Bibliography

The Schooling of Foresters

By HERBERT A. SMITH, United States Forest Service

In 1927 a special committee of the National Academy of Sciences conducted an inquiry into research in forestry. One outcome was a special report on forest education, prepared by Dean Henry S. Graves of the Yale School of Forestry. From this sprang the "Forest Education Inquiry" conducted under the auspices of the Society of American Foresters and financed through a Carnegie Corporation grant of \$30,000. Its results are embodied in a volume² not only monumental in the history of forest education but also a notable contribution to the literature of higher education in the United States, from the broadest viewpoint.

In the April 1928 issue of the *Journal of Forestry*, Dean Graves pointed out at what the inquiry should aim. "Even a superficial study of our system of education in forestry", he said, "reveals numerous defects. Progress in remedying these defects and in strengthening our forestry institutions would be greatly aided by a study of our educational problems more far-reaching and more profound than has yet been made. * * * The objects of the proposed study would be to determine more specifically than has been done the educational requirements of the profession and whether our present system of training is suited to meet them; to obtain information that will aid the schools to clarify their objectives and special functions and to shape their courses accordingly; to determine how the schools may better coordinate their educational work with the needs of practice; and how they may improve their facilities for instruction and make effective their methods of teaching."

In short, the undertaking was to bring out how well the schools engaged in training professional foresters are doing their work, and how they might do it better. But the study was carried out along much broader lines than this suggests. Subprofessional as well as professional education is dealt with, and forest education for those who do not intend to make their living through the practice of forestry, as well as for those who do. Nevertheless, the main concern is with the

educational equipment required in the United States to turn out an adequate supply of competent men for the various lines of work into which professional foresters will naturally go and in which they are needed.

It is impossible within the space of a brief notice to indicate the thoroughness with which the ground is covered or to point out even the major conclusions. The bulk of the book is given to Part II, The Occupations of Foresters, Part III, The Education of Foresters, and Part IV, Problems of the Forest Schools. A concluding part summarizes illuminatingly, for comparative purposes, the objectives, systems, and special features of forest education abroad and the training given forest officers in various countries of Europe. Part I briefly summarizes, in its second chapter, the history of forest education in the United States. Its first chapter is less introductory than fundamental. It is the very cornerstone of the whole work. Once and for all, it impregnably establishes the place of forestry as an independent profession and the claims of forestry as a science occupying its own field.

Two sentences from the final paragraph make the matter clear. "The utilization of various sciences and arts by the forester has created misconception as to his exact position among the professions * * *. The forester is a specialist in forest science, dealing with a distinctive and unique problem, the solution of which requires a highly organized body of science and a specialized technique." Upon this conception it is necessary to rear the structure of the forest school as an educational institution.

Preparing foresters properly for the practice of a profession of this character requires forest schools with adequate faculties, adequate financial resources, adequate physical facilities, and adequate educational objectives. Whether there are too many forest schools is perhaps questionable, since the future requirements of the country for trained foresters is uncertain; but the number of weak schools is an indubitable ground for dissatisfaction. There are 26 collegiate institutions in the United States which offer work in forestry, and they have on their forestry teaching and research staffs an aggregate of 164 persons; but 4 institutions have more than one half the total and only in 6 institutions do these staffs number more than 5 persons. A faculty of at least 5 experienced and competent men, each qualified to teach as a specialist in a particular sub-

² Graves, Henry S., and Guise, Cedric H.: *Forest Education*. Yale University Press, pp. XVII, 421. 1932.

division of the field, is held by the authors of *Forest Education* essential for an undergraduate forest school; but of the 23 institutions of this character 12 have staffs of less than 5 men and an aggregate of only 32. A tabulated statement of the funds allotted to 24 schools for a single college year shows 3 schools with allotments of more than \$100,000 and 8 with allotments of less than \$10,000.

The greatest weakness in forest education in the United States is, beyond all doubt, its inadequate financial support. That is something for foresters to think about, and concern themselves about. Not that the situation can in other respects be left to take care of itself. The educational task and educational problems to be grappled with in order to make forest education what it should be are of very large proportions, as the work conducted by the Inquiry and now presented in published form makes abundantly clear; but that they have been so illuminatingly disclosed by this study affords assurance of swift and well-directed progress, within the limits set by financial considerations.

Forest Bankruptcy in the States

By W. N. SPARHAWK, United States Forest Service

Colonel Ahern has performed a valuable service in bringing together, largely from official sources, a vast quantity of information on the forest situation in each State in his book, *Forest Bankruptcy in America*.¹ He emphasizes especially the wood requirements of the State and the ability of its forests to meet these requirements.

One may disagree with the implication that each State should adopt a policy of economic self-sufficiency. It appears to be no more logical for Iowa or Kansas or Nebraska to grow all the wood they consume than for New York or New Jersey or Massachusetts to grow all of their corn or beef or wheat. Yet perhaps this is no more unreasonable than the idea that Wisconsin, for instance, should base her forest policy merely on the quantity of wood required within her own boundaries. (See *Forest Land Use in Wisconsin: Report of Wisconsin Committee on Land Use and Forestry*, 1932.) The very fact that some States cannot hope to meet their own timber needs and that others cannot consume all their forests will produce is one reason why forestry is a national rather than a purely local problem. Nevertheless, it is unquestionably desirable that each State utilize productively its forest land resources, and that timber be grown close to the point of consumption so far as economically practicable.

Colonel Ahern proposes a four-point program, including public regulation of cutting sufficient to prevent devastation; increased public expenditures for fire protection; extension and education; and greatly

increased public ownership of forests. Although there may be different opinions as to the necessity for perpetuating our forests, most persons who are familiar with the situation will agree that if this is to be done nothing less than the proposed program will accomplish the result.

A Translation of Braun-Blanquet's Study of Plant Communities

By R. S. CAMPBELL, United States Forest Service, and IMOGENE J. CAMPBELL

American forest ecologists with a limited reading knowledge of German will welcome the recently published translation of Braun-Blanquet's *Pflanzensoziologie* by Fuller and Conard.¹ With its summary of the latest European work, the book should prove valuable to both field men and students. The need of the forester for such a book is indicated by the statement of the author: "The ultimate aim of every reasonable attempt to control vegetation, aside from purely aesthetic aims, consists in influencing the habitat so as to give permanently the greatest possible returns. But this goal can be approached only when farmers and foresters alike acquaint themselves with and apply the teachings of soil science and plant sociology."

The subject matter is divided into six parts, the first two of which deal with plant social life and organization of plant communities. Methods of analysis of the structure of plant communities given are along the more theoretical lines of plant sociology rather than the practical ones of forestry and agriculture.

Part 3 considers the dependence of plant communities upon one another and upon their environment. Factors of the habitat are treated under four heads: Climatic, edaphic or soil, topographic, and biotic. Research results and problems of interest to workers in agriculture and forestry are discussed.

Foresters have measured and correlated relative humidity with forest growth for long periods, but the relation of humidity to the transpiration of forest trees seems to remain uninvestigated. It is here suggested that the distribution of many climax communities is undoubtedly governed by the saturation deficit of the air. The author also states that the evaporating power of the air, although greatly under-rated by practical foresters, is undoubtedly an extremely important factor in forest ecology.

In discussing the relation of forest boundary to wind effects it is suggested that many mistakes in reforestation might be avoided through a knowledge of the specific wind resistance of trees and their relation to the wind factor near the timber line.

¹ Ahern, George P.: *Forest Bankruptcy in America: Each State's Own Story*; with a foreword by Gifford Pinchot. 319 pp. Washington, D.C., The Green Lamp League. 1933.

¹ Fuller, George D., and Conard, Henry S.: *Plant Sociology* (authorized English translation of *Pflanzensoziologie* by J. Braun-Blanquet; revised and edited). 405 pp., 180 figs., 42 tables. New York, McGraw-Hill Book Co., Inc. 1932.

Soil problems are treated in the light of the newer view that climatic factors are more important than the nature of the organic substratum in soil formation. Thus the production of organic matter and the kind and intensity of its effects are, like the soil-forming processes themselves, subject to the climate.

Erosion is briefly considered, with suggestions of types of soil which should be kept intact with their plant cover or reforested. The importance of soil texture and structure is emphasized. The maintenance of the crumb structure of the soil and the ecological effect of its oxygen and carbon dioxide content are treated from the forester's viewpoint. Results are quoted from Burger, who in examining air capacity of the soil always found that greater air capacity indicates a higher value in forestry and that the pore volume of the soil decreases considerably after deforestation.

Nitrification of forest soil, types of humus, effect of leaf litter and pH conditions favoring nitrification are discussed. Explanation is given for the acid reaction of sandy forest soils. The influence upon plant communities of exposure, or inclination toward the sky, is elaborated, including soil and soil-surface temperatures at various exposures with influence upon vegetation, decomposition, and seed germination.

Grazing, effect of the use of fire for pasture improvement, forest ranges, selective timber cutting, soil fauna and flora, and effect of animals upon vegetation, are briefly discussed.

Part 4 is concerned with the rise, development, and decline of plant communities. It is emphasized that a study of the development of vegetation is necessary before ecological experiments can be successful. An example of such an experiment is the stabilization and forestation of the wandering dunes south of Cape Sim on the Moroccan coast.

Part 5 treats of the geographic distribution of communities and the mapping of vegetation by line and belt transects. Part 6 concerns various classifications of plant communities.

Exhaustive search of literature is shown by the bibliography of nearly 700 citations, in which are included as far as possible the more important contributions of North American, English, and Russian scholars.

Two Books on Log Chutes

Methods of wood transportation are treated in two recent publications, one American, the other Austrian. *Transportation of Wood in Chutes*, issued as Yale University School of Forestry Bulletin No. 34, is by Alexander M. Koroleff and Ralph C. Bryant.⁵ Part 1,

written by Mr. Koroleff, contains descriptions of the construction and operation of the types of wood and log chutes that have been used in various parts of the world. Methods of checking and accelerating the velocity of chuted material are considered from the practical point of view. Professor Bryant, in part 2, discusses the technical side of chute construction and operation, including the engineering principles involved. Part 3 contains a bibliography.

Wood transport in the mountains of Austria is very highly developed mechanically. In *Riesanlagen und Seilbahnen (Log Slides and Cableways)*, by Leo Hauska and Julius Duhm of the Hochschule für Bodenkultur, Vienna, slides, flumes, and overhead cableways are described and illustrated. Every phase of the scientific construction and operation of these logging devices is dealt with in this 320-page book. The text is in German. Dr. Hauska is professor of engineering at the hochschule.

Recent Publications of the Forest Service

(These publications can be obtained from the Superintendent of Documents, Washington, D.C., at the prices indicated.)

Technical Bulletin 342-T, *Causes of Brashness in Wood*, by Arthur Koehler. 5 cents.

Technical Bulletin 343-T, *Specific Gravity and Related Properties of Softwood Lumber*, by Edward C. Peck. 5 cents.

Technical Bulletin 346-T, *The Effect of Concentration on the Toxicity of Chemicals to Living Organisms*, by Ernest Bateman. 5 cents.

Farmers' Bulletin 1392-F, *Black Walnut for Timber and Nuts*, by W. R. Mattoon and C. A. Reed. (Revised.) 5 cents.

Farmers' Bulletin 1697-F, *Using Soil-Binding Plants to Reclaim Gullies in the South*, by H. G. Meginnis. 5 cents.

Leaflet 86-L, *Protect Hardwood Stands from Grazing*, by W. K. Williams. 5 cents.



The Tree Lover, a magazine "devoted to tree lore in all its aspects", is being published quarterly by Alexander Moring, Ltd., of London, the first issue having appeared in October 1932. The new periodical contains articles on forestry and trees from all parts of the world and is attractively illustrated. The editor is the Rev. Canon Lonsdale Ragg, who has published two books of original drawings of trees. Subscriptions to the *Tree Lover* (at the rate of 5 shillings per year, including postage) may be sent to the publishers at 2A Cork Street, Bond Street, London, W. 1, England.

⁵ 139 pp., illus. New Haven, Conn. 1932.